art of record does not describe the claimed coil adjuster positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping.

Pending Claims

Claims 1-5, 7-9, 11-21, 24-25, and 27 32 are pending in the present application. Claims 1 and 24 have been amended. Claims 10 and 26 have been canceled. Claims 6 and 22-23 have been previously withdrawn from consideration pursuant to 37 CFR §1.142(b) as being drawn to non-elected groups. The Applicants respectfully requests reconsideration of the pending claims in light of the amendments and remarks presented in this Amendment and Response.

Rejections under 35 U.S.C. §102

Claims 1-3, 7-8, and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,567,268 to Kadomura (hereinafter "Kadomura '268"). Claims 1-4 and 7 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,875,307 to Okumura (hereinafter "Okumura '307"). Claims 1-3 and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,096,160 to Kadomura (hereinafter "Kadomura '160").

To anticipate a claim under 35 U.S.C. §102, a single reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught by the reference must be inherently present in the reference. Thus, a claim is

anticipated by a reference only if each and every element of the claim is described, either expressly or inherently, in a single prior art reference.

Independent claim 1 has been amended to recite a radio frequency antenna including an active antenna surrounding the plasma chamber and coupled to the RF source at a first end and coupled to ground at a second end and a parasitic antenna surrounding the plasma chamber to provide a parasitic effect, wherein the parasitic antenna is not directly coupled to any RF source. Independent claim 1 has also been amended to recite a platen for holding a target and biasing the target with a negative voltage. Independent claim 1 has also been amended to recite that the plasma comprises ions that are attracted to the target by the negative voltage, thereby implanting ions into the target. Furthermore, independent claim 1 has been amended to recite a coil adjuster positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping.

Kadomura '268 Rejection

Regarding Kadomura '268, the Office Action states that Kadomura '268 illustrates a parasitic antenna with reference numbers 22 or 31. In addition, the Office Action states that Kadomura '268 describes a plasma that is tuned by parasitic damping via the parasitic antenna and refers to FIGS. 2-3 and the corresponding description.

The Applicants have carefully reviewed Kadomura '268 and the corresponding description and can not find any indication that Kadomura '268 is describing a parasitic antenna that provides a parasitic effect. The Examiner's Interview Summary, mailed on

October 11, 2007, states that "a reference may not disclose all possible uses of an apparatus in its disclosure." Kadomura '268, however, clearly does not intend that the Kadomura '268 apparatus be used with a parasitic antenna. In fact, Kadomura '268 specifically states that switches 35, 38 are used to configure the antennas to either (1) simultaneously produce a helicon wave plasma and an inductively coupled plasma by turning both switches 35 and 38 on (see column 7, lines 18-30) or (2) to produce only a helicon wave plasma by switching switch 35 on and switching switch 38 off (see column 7, lines 31-36).

Furthermore, the Applicants have carefully reviewed Kadomura '268 and the corresponding description and can not find any description in the text corresponding to FIGS. 2-3 that indicates that the plasma is tuned by parasitic damping via the parasitic antenna. Independent claim 1 has been amended to recite a structural limitation that the apparatus include a coil adjuster positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping.

The Applicants submit that Kadomura '268 does not describe the active antenna and the coil adjuster claimed in independent claim 1 as currently amended. Furthermore, the Applicants submit that the apparatus described in Kadomura '268 does not inherently use such a coil adjuster in any mode of operation contemplated by the inventors. The Applicants believe that the apparatus described in Kadomura '268 can not be used in a way that parasitic antennas tune the ionic plasma by parasitically damping as recited by independent claim 1 as currently amended without changing existing hardware. If the present rejection of independent claim 1 is maintained, the Applicants respectfully

request that the Examiner specifically state what part of the description corresponding to Kadomura '268 FIGS. 2-3 indicates that the plasma is tuned by parasitic damping via the parasitic antenna.

Okumura '307 Rejection

Regarding Okumura '307, referring to Okumura '307 FIG. 1, the antennas described in Okumura '307 are configured so that the high-frequency power of an RF source 100 MHz is supplied by a high-frequency power source 104 to one end of the first conductor 106a. The other end of the first conductor 106a is open. One end of the second conductor 106b is grounded. The other end of the second conductor 106b is open. See Okumura '307 column 9, lines 1-21. Similarly, Okumura '307 describes various other embodiments with a first conductor having one end connected to a hot side of a high-frequency power source and another end open; and a second conductor having one end connected to ground and another end open. See Okumura '307 FIGS. 8-10, 15-16, and 20 and their corresponding description. Thus, Okumura '307 describes apparatus with conductors having one end connected to the hot side of a high-frequency power source and another end open.

Independent claim 1 has been amended to recite a radio frequency antenna including an active antenna surrounding the plasma chamber and coupled to the RF source at a first end and coupled to ground at a second end and a parasitic antenna surrounding the plasma chamber to provide a parasitic effect, wherein the parasitic antenna is not directly coupled to any RF source. The Applicants submit that the active

antenna recited in independent claim 1 as currently amended is structurally different than the conductors described in Okumura '307. Independent claim 1 has been amended to recite a structural limitation that the apparatus include a coil adjuster positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping.

The Applicants submit that Okumura '307 does not describe the active antenna, the passive antenna, and the coil adjuster claimed in independent claim 1 as currently amended. Furthermore, the Applicants submit that the apparatus described in Okumura '307 does not inherently use the claimed active antenna, passive antenna, and coil adjuster in any mode of operation contemplated by Okumura '307. The Applicants believe that the apparatus described in Okumura '307 can not be used in a way where a parasitic antennas tunes the ionic plasma by parasitically damping as recited by independent claim 1 as currently amended without changing existing hardware.

Kadomura '160 Rejection

Regarding Kadomura '160, the Office Action states that Kadomura '160 describes an apparatus comprising a RF antenna including an active antenna and a parasitic antenna where the plasma is tuned by parasitic dampening via the parasitic antenna. The Office Action refers to Kadomura '160 FIGS. 5-6 and the corresponding description. The Applicants and the Applicant's attorney have reviewed Kadomura '160 FIGS. 5-6 and it corresponding description and can not find any description of tuning a plasma by parasitic dampening via a parasitic antenna.

The Kadomura '160 description of FIGS. 5-6 describes two modes of operation. In the first mode, the switch 67 is turned on, as shown in FIG. 5, and the current is supplied to the solenoid coil 53 from a DC source 68 and a helicon wave plasma is generated in the bell jar 51. In the second mode, the switch 67 is turned off, as shown in FIG. 6 and no magnetic field is produced in the bell jar 51. According to Kadomura '160 an inductively coupled plasma is induced in the bell jar 51, but no helicon wave plasma is generated. Also, according to Kadomura '160 , the switch 67 allows the user to promptly switch to the helicon wave plasma or to the inductively coupled plasma. See, in particular, Kadomura '160 Column 10, line 63 to Column 11, line 7. Thus, the Applicants submit that the description of Kadomura '160 FIGS. 5-6 does not include a description of using a parasitic antenna and does not include tuning the plasma by parasitic dampening via a parasitic antenna.

Independent claim 1 has been amended in part to recite a coil adjuster positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping. The Applicants submit that Kadomura '160 does not describe such a coil adjuster. Furthermore, the Applicants submit that the apparatus described in Kadomura '160 does not inherently use such a coil adjuster in any mode of operation contemplated by Kadomura '160. The Applicants believe that the apparatus described in Kadomura '160 can not be used in a way that parasitic antennas tune the ionic plasma by parasitically damping as recited by independent claim 1 as currently amended without changing existing hardware.

If the present rejection of independent claim 1 is maintained, the Applicants

respectfully request that the Examiner specifically state what part of the description corresponding to Kadomura '160 FIGS. 5-6 indicates that a parasitic antenna is used and that a coil adjuster is positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping.

Therefore, the Applicants submit that the present amendment to claim 1 overcomes the rejection of independent claim 1 and thus independent claim 1 is allowable over the prior art of record. In addition, the Applicants submit that dependent claims 2-5, 7-9, and 11-21 are allowable as depending from an allowable base claim.

Rejections under 35 U.S.C. §103(a)

Dependent claims 4, 5, 9, and 12-21 are rejected under 35 U.S.C. §103(a) as being unpatentable over numerous references. In light of the amendments to independent claim 1 and the above arguments made in connection with the rejection under 35 U.S.C. §102(b), the Applicants submit that dependent claims 4, 5, 9, and 12-21 are allowable as depending from an allowable base claim.

Claims 24-25, 27 and 31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kadomura '268 in view of U.S. Patent No. 5,556,501 to Collins (hereinafter "Collins") and U.S. Patent No. 5,824,607 to Trow et al. (hereinafter "Trow"). The Office Action states that Kadomura shows the invention substantially as claimed in independent claim 24, but does not expressly disclose a liquid cooled top conductive section coupled to the vertical section. The Office Action further states that in view of the disclosures in Collins and Trow, it would have been obvious

to one of ordinary skill in the art at the time of the invention to modify the apparatus of Kadomura so as to include a liquid cooled top conductive section as disclosed by Collins and Trow.

To be unpatentable under 35 U.S.C. §103(a), the differences between the subject matter sought to be patented and the prior art must be such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. To establish a prima facie case of obviousness, the prior art references must teach or suggest all the claim limitations. Also, there must be a reasonable expectation of success.

Independent claim 24 has been amended to recite a coil adjuster positioned in the parasitic antenna that adjusts a number of turns of the parasitic antenna for tuning the ionic plasma by parasitically damping. As described in connection with the rejection of independent claim 1 under 35 U.S.C §102(b) the Applicants submit that Kadomura '268 does not describe the claimed coil adjuster. In addition, the Applicants submit that Collins and Trow do not describe the claimed coil adjuster. Thus, the Applicants submit that the prior art references do not teach or suggest all the claim limitations of independent claim 24. Therefore, the Applicants submit that independent claim 24 is allowable and that dependent claims 25 and 27-32 are allowable as depending from an allowable base claim.

Dependent claim 5 has been rejected under 35 U.S.C. §103(a) as being obvious over Kadomura '286 in view of U.S. Patent No. 6,465,051 to Sahin and in

view of U.S. Patent No. 5,888,413 to Okumura et al. (hereinafter Okumura '413). Dependent claim 29 has been rejected under 35 U.S.C. §103(a) as being obvious over Kadomura '286 in view of Collins, Trow, and Sahin and further invoice of Okumura '413.

Dependent claims 5 and 29 recite a means for adjusting a number of turns of the parasitic antenna providing a parasitic effect. The Office Action, referring to Okumura '413 FIGS. 20-23, states that Okumura '413 discloses a means for adjusting the length and number of turns of a coil. The Applicants submit that Okumura '413 describes a means for changing the shape of a portion of one turn of a coil, not a means for adjusting the number of turns of a coil as claimed by the amended claims. See, for example, Okumura '413, column 10, lines 64-67, column 11, lines 13-15, and 26-28 and FIGS. 20-23.

Also, the means for changing the shape of the coil described in Okumura '413 does not adjust a number of turns of a parasitic antenna for tuning the ionic plasma by parasitically damping as claimed by the pending claims as currently amended. Instead, the means for changing the shape of the coil described in Okumura '413 controls the plasma density in-plane distribution. See, for example, Okumura '413, column 10, lines 64-67, column 11, lines 13-15, and 26-28.

Other dependent claims were rejected under 35 U.S.C. §103(a) as being unpatentable over numerous references. However, the Applicants believe that these

rejections are moot in light of the amendments to independent claims 1 and 24 and the above arguments.

CONCLUSION

Claims 1-5, 7-9, 11-21, 24-25, and 27 32 are pending in the present application. Independent claims 1 and 24 have been amended by this Amendment and Response. The Applicants respectfully requests reconsideration of the pending claims in light of the amendments, remarks, and arguments presented in this Amendment and Response.

The Applicants have requested a telephonic interview if the present rejections are maintained in order to expedite prosecution of the present application. The undersigned attorney would welcome the opportunity to discuss any outstanding issues, and to work with the Examiner toward placing the application in condition for allowance.

Respectfully submitted,

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